

# CINR Webinar

# FC3: Materials Control and Accounting Technology

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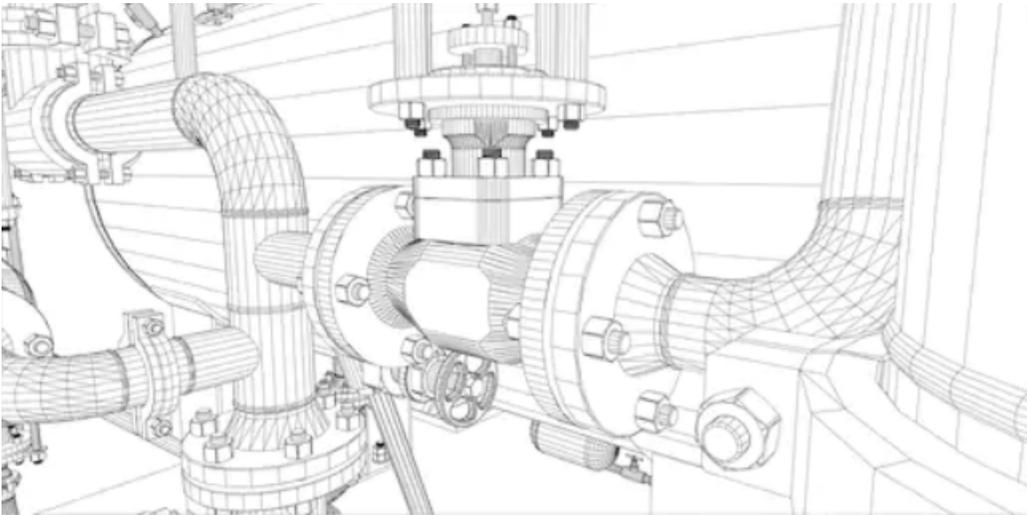


U.S. DEPARTMENT OF  
**ENERGY**

# Materials Protection, Accounting and Control Technology (MPACT)

## Vision

An economically competitive fleet of domestic advanced reactors and fuel cycle facilities meeting current and future nuclear material control and accounting requirements.



## Mission

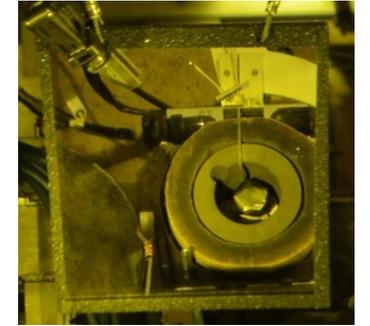
To enable next generation nuclear materials management for advanced fuel cycles.

# Materials Protection, Accounting and Control Technology

**Strategy 1** – Develop innovative technologies, analysis tools, and advanced integration methods.

## Goals

- ❑ Develop and demonstrate advanced MC&A technologies.
- ❑ Develop and apply analysis tools to improve the efficiency and effectiveness of safeguards and security systems.
- ❑ Develop advanced integration methods to apply effective combinations of technology and analysis tools.



U/TRU measurement system, Idaho National Laboratory

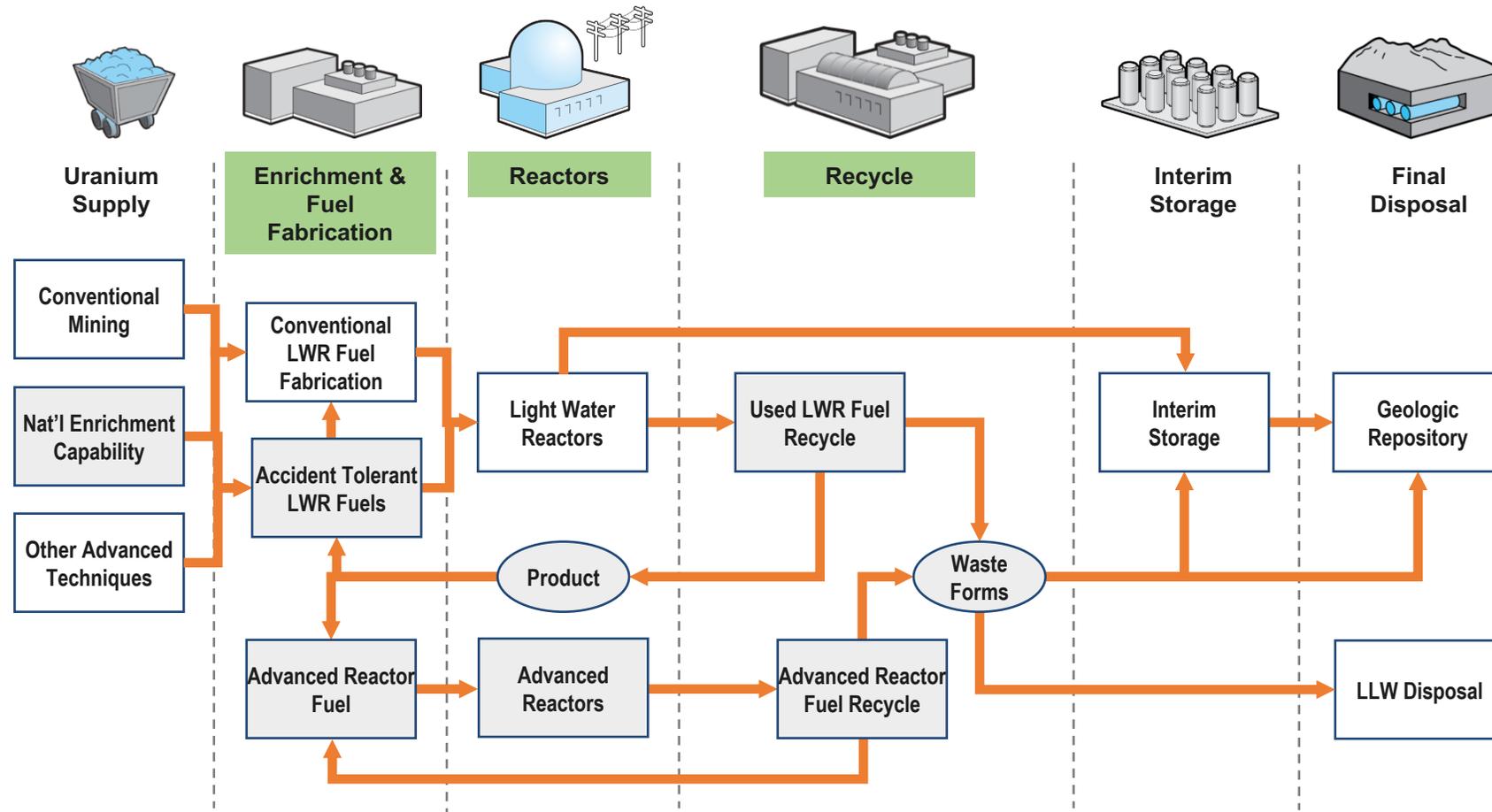
**Strategy 2** – Coordinate and engage with government and industry stakeholders early in the technology development process.

## Goals

- ❑ Perform technical assessments in support of advanced fuel cycle concepts and approaches.
- ❑ Develop guidelines for safeguards and security by design and apply them to new facility concepts.



# FY19 MPACT MC&A Focus Areas



# MPACT R&D Challenges

- ❑ Advanced reactors and processing/recycling facilities present safeguards challenges not yet fully addressed by existing technology and approaches.
  - High heat and high radiation environments, online processing, liquid fuel and/or coolant, new product and waste streams, variable radiation backgrounds, etc.
- ❑ Will require a combination of technology, analysis tools, and advanced integration methods in order to:
  - Improve the accuracy and precision of nuclear material accountancy measurements while maintaining or improving their timeliness and cost-effectiveness.
  - Expand the scope of detection to include more indicators.
  - Combining indicators in novel ways to generate new NMA data.



Triple bubbler system in the Hot Fuel Examination Facility,  
Idaho National Laboratory



Microcalorimeter gamma spectrometer,  
Los Alamos National Laboratory and  
University of Colorado Boulder

# FC-3: Materials Control and Accounting Technology

Proposals are requested to develop innovative materials control and accounting technologies and tools for molten salt related nuclear energy applications. Technologies and tools should be able to increase the accuracy, reliability, and efficiency of nuclear materials quantification and/or tracking capability.

This includes novel ideas for improving detection and quantification of actinides or combinations of indicators that may be required for nuclear material accountancy in the challenging environment of molten salt reactor and/or fuel processing facilities.

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